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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 217	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/KR 2004/001363	International filing date (day/month/year) 8 June 2004 (08.06.2004)	Priority Date (day/month/year) 20 November 2003 (20.11.2003)
International Patent Classification (IPC) or national classification and IPC IPC⁸: H01L 21/027 (2006.01)		
Applicant IUCF-HYU (INDUSTRY-UNIVERSITY COOPERATION FUNDATION HANYANG UNIVERSITY)		

1. This international preliminary examination report has been prepared by this International Preliminary Examination Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:
 - ☒ Basis of the opinion
 - ☐ Priority
 - ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Lack of unity of invention
 - ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Certain documents cited
 - ☐ Certain defects in the international application
 - ☐ Certain observations on the international application

Date of submission of the demand 15 June 2005 (15.06.2005)	Date of completion of this report 8 March 2006 (08.03.2006)
Name and mailing address of the IPEA/AT Austrian Patent Office Dresdner Straße 87 A-1200 Vienna Facsimile No. 1/53424/200	Authorized officer SCHLECHTER B. Telephone No. 1/53424/448

Form PCT/IPEA/409 (cover sheet) (July 1998)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.

PCT/KR 2004/001363

I. Basis of the report

1. With regard to the elements of the international application:*

☒ the international application as originally filed

☐ the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____.

☐ the claims:

pages _____, as originally filed

pages _____, as amended (together with any statement) under Article 19

pages _____, filed with the demand

pages _____, filed with the letter of _____.

☐ the drawings:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____.

☐ the sequence listing part of the description:

pages _____, as originally filed

pages _____, filed with the demand

pages _____, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).

☐ the language of publication of the international application (under Rule 48.3(b)).

☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in printed form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____.

☐ the claims, Nos. _____.

☐ the drawings, sheets/fig _____.

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as „originally filed“ and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

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PCT/KR 2004/001363

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement	Novelty (N)	Claims 1-3	YES
		Claims ----	NO
	Inventive step (IS)	Claims 1-3	YES
		Claims ----	NO
	Industrial applicability (IA)	Claims 1-3	YES
		Claims ----	NO

Citations and explanations (Rule 70.7)

The following documents are cited in the Search Report:

D1: KR 200073498 A
D2: JP 05283323 A
D3: US 432940 A
D4 : US 6338990 A

D1 discloses a semiconductor device manufacturing method where exposed first thin film is etched by using the photoresist layer pattern as a mask. A second thin film of which an index of light refraction, a light absorption coefficient and a thickness are properly controlled according to the index of light refraction and light absorption coefficient of the photoresist layer, first thin film and lower thin film, is formed between the first thin film and the lower thin film.

D2 shows a x-ray exposure mask manufacturing method comprising formation of silicones and eutectic on rear side of blank substrate and patterning thin film thereon. Etching of back substrate for high precision pattern positioning is performed.

D3 describes a x-ray lithography mask preparation method including coating of a substrate with UV resist, UV impermeable layer, and beam resist. Processing and depositing x-ray absorbent are producing patterns on micro-chips.

D4 offers a fabrication process for transistor used in active matrix LCD which involves attaching conducting layer selectively to drain and source as basis for growth of further semiconductor layers.

The cited documents disclose prior art techniques for achieving micro structured circuit patterns in manufacturing semiconductor elements using extreme ultraviolet radiation.

However, the cited documents are neither disclosing nor suggesting the recited manufacturing steps, namely
depositing a reflective multi-layered thin film and a capping layer,
depositing a thin metal film selected from chromium, tantalum, and tungsten as an absorber layer on the multi-layered thin film and the capping layer,

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International application No.
PCT/KR 04/01363

Supplemental Box

(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: **Box V (page 1)**

selectively forming metal oxide structures with fixed height and width on substrates by applying electric field between cantilever tip and the multi-layered structure of the substrate using an atomic force microscope,
and forming ultra-fine line width absorber patterns by etching of the metal oxide structure.

Dependent claims 2 and 3 recite preferred embodiment of independent claim 1.

Therefore, the subject matter of claims 1 to 3 can be considered new and involving an inventive step.

Industrial applicability is given, as well.